

COASTAL EVOLUTION: LATE QUATERNARY SHORELINE MORPHODYNAMICS edited by R. W. G. Carter and C. D. Woodroffe, Cambridge University Press, Cambridge, 1994. No. of pages: xxi+517. Price: £50. ISBN 0-521-41976-X.

This substantial collection of 13 papers has its origins in the International Geological Correlation Programme (IGCP) Project 274 'Quaternary coastal evolution: case studies, models and regional patterns'. Project 274 adopted the enhanced understanding of late Quaternary relative sea-level changes achieved through earlier IGCP Projects (61 and 200) as a starting point for local and regional models of the evolution of past, present and, potentially, future coastlines. Sea-level change is but one of a number of 'operating variables'. Feedbacks between topography, materials and sediment-transporting processes interact with sea-level in a strongly time-dependent manner, the joint probabilities of which produce coastal evolutionary behaviour that is essentially unrepeatable. The idea of conceptual models, developed around case studies and subsequently evaluated for their wider applicability, underpins this collection of papers. This is a convincing rationale which, coupled with a strong editorial vision, results in a thought-provoking and readable insight into what is presently comprehended of coastal behaviour over the past 125 000 years.

The volume is organized into two 'position papers', followed by 11 chapters which address specific coastline types. Carter and Woodroffe (Chapter 1) delve into the history of scientific research into longer-term coastal behaviour, emphasizing the need to integrate two hitherto separate paradigms of coastal environmental research: contemporary process dynamics on the one hand, and late-Quaternary environmental change on the other. This is

followed up by an excellent treatment of the conceptual tools necessary for understanding the morphodynamics of coastal evolution (Cowell and Thom, Chapter 2). These two chapters alone would constitute a fine introduction to many undergraduate courses in coastal geomorphology. The subdivision of coastal types throughout the remainder of the volume is logical enough, and the contributions, for the most part, both authoritative and informative. The balance between case study and conceptual models having more general applicability varies and some of the material is, by now, familiar. Contributions on deltaic (Suter) and developed coasts (Nordstrom) are pretty well rooted in the Gulf of Mexico and the New Jersey barrier shoreline, respectively; those on paraglacial (Forbes and Syvitski) and tectonic (Pirazzoli) coasts are a little wider ranging. Other noteworthy contributions deal with macrotidal estuaries (given a decidedly north Australian slant by Chappell and Woodroffe), coral atolls (McLean and Woodroffe) and shallow reefs (Hopley), and wave-dominated coasts (Roy, Cowell, Ferland and Thom). Readers will, no doubt, discern gaps in the coverage of particular coastal systems; the scarcity of European examples might be interpreted as either an omission or a strength, depending on one's point of view!

There is a great deal of good material here, in a well conceived volume that does ample justice to the objectives of IGCP 274, the skill and judgement of its editors, and the efforts of the contributing scientists. It offers a welcome break from the reductionism of small-scale process work and should find a place in the library of every serious coastal scientist.

J. R. FRENCH
*Department of Geography
University College London*

PLATE TECTONICS AND CRUSTAL EVOLUTION, 4th edition, by Kent C. Condie, Butterworth Heinemann, Oxford, 1997. No. of pages: x + 282. Price: £24.99 (pb).

This book is a well established text that first appeared in 1976 and has now reached its fourth edition. Its focus is the evolution of the Earth's crust in the context of plate tectonics, although the atmosphere, the oceans, and life on Earth are also briefly considered, as is planetary evolution.

The book begins with an overview of plate tectonics, and this is followed by a more detailed discussion of the nature of the crust. The third chapter explores the range of tectonic settings arising from plate interactions and leads into a brief outline of the properties and behaviour of the Earth's core and mantle. The geological history of the Earth over the past 4 billion years is covered in the following two chapters, with Chapter 5 considering the evolution of the crust and mantle, and Chapter 6 exploring changes in the atmosphere and oceans and the related history of climate and life. The book concludes with a brief and very selective review of comparative planetary evolution.

Major changes and additions have been made to the text since the third edition which was published in 1989. These

reflect the continuing rapid growth of knowledge about the Earth's evolution and include discussions of mantle plumes, the supercontinent cycle, the episodic nature of orogeny and continental growth, and interactions between the lithosphere, hydrosphere, atmosphere and biosphere – this last theme a reflection of current interests, particularly in the United States, in so-called Earth system science. The book claims to be aimed at graduates and senior undergraduates, and is clearly orientated towards the American market. As such it incorporates some material which would be covered at first or second year level in Earth science courses in the UK.

The book will be of little interest to geomorphologists. Where it does touch on geomorphological topics, such as the factors controlling continental elevation and the relationships between atmospheric CO₂ concentration and rates of chemical weathering, the treatment is not sure-footed. Sadly a major opportunity has been lost in the book in not making a more serious attempt to incorporate relevant aspects of geomorphology, especially given the high level of recent interest within the Earth sciences in the relationships between tectonics and surface processes.

M. A. SUMMERFIELD
*Department of Geography
University of Edinburgh*